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ABSTRACT

This report presents four presentations made at a workshop which was held in Richmond, Virginia, to assist teacher educators to better prepare vocational teachers for competency-based instruction. The first presentation, "The Promise of Competency-Based Vocational Education," summarizes the contemporary curricular movement toward competency-based vocational education (CBVE). In addition, it describes CBVE as focusing on five key areas: (1) the nature of competencies, (2) criteria used to assess competencies, (3) ways that student competence is assessed, (4) student progress through the program, and (5) the program's instructional intent. The second presentation, "Preparing Vocational Teachers to Cope with Competency-Based Instruction," focuses on teacher education's role in training teachers to cope with CBVE. The third presentation, "Implementing CBVE at the Local Level," describes a local school district's efforts to implement CBVE in Minnesota. The final presentation, "CBVE in Virginia," describes the CBVE implementation strategy being used in Virginia. It describes the roles of teacher education institutes, local school divisions, and vocational service areas. Virginia standards for competency-based education programs are listed. (A suggested framework for a CBVE course is appended.) (LRA)

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COMPETENCY-BASED VOCATIONAL EDUCATION
IMPLICATIONS FOR VOCATIONAL
TEACHER EDUCATORS

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In Cooperation with the Virginia State Department of Education

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OVERVIEW

This monograph is a result of a State-funded professional development project and the Inservice Workshop on Competency-Based Vocational Education which was held in Richmond, Virginia, on May 9-11, 1979. The project was prompted by a need to better develop the skills of Virginia vocational teachers in the area of competency-based vocational education. A Virginia State Department of Education mandate requires the implementation of competency-based vocational education by June 30, 1982. Vocational teachers need to be better prepared by teacher educators in order to implement such a program.

A major purpose of the workshop was to assist teacher educators to better prepare vocational teachers for competency-based instruction. At the workshop an emphasis was placed on providing information on issues raised at the May 1978 meeting held in Richmond, Virginia, on competency-based vocational education.

In order to provide direction for the workshop, a Steering Committee was formed, consisting of the project director John Hillison, the co-director Curtis Finch, Maude Goldsten, Tom Hephner, Arnold Westbrook, John Ritz and Foster Miles. This committee identified the theme for the workshop, special interest group workshop topics, workshop speakers and leaders for special interest group meetings.

The project staff issued an invitation to Virginia vocational teacher education programs for nominating participants. The workshop emphasized a sharing of information from outside consultants and between Virginia vocational teacher educators.

The target population for the project consisted of representatives from the fourteen vocational teacher education institutions in Virginia. In addition, state supervisors representative of the vocational program areas in Virginia were also invited to participate. A total of 30 teacher educators and state supervisors participated in the workshop.

The workshop format included using outside consultants, some of whose presentations are included herein. Other consultants included Jean Epps, Director of Vocational Education, Newport News City Schools, who talked on "The Local Vocational Director and CBVE;" and Dan Vogler, Division Director of Vocational-Technical Education at VPI & SU, who discussed the "Affective Aspects of CBVE." Special interest groups discussed CBVE within service areas and examined curriculum materials.

Hopefully, this monograph will serve as a catalyst for future refinement of CBVE pre- and inservice programs across the Commonwealth. It is only through our collective efforts that CBVE will become a viable means of improving the learning process in vocational education.

John Hillison
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THE PROMISE OF COMPETENCY-BASED VOCATIONAL EDUCATION

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THE PROMISE OF COMPETENCY-BASED VOCATIONAL EDUCATION[1]

Competency-based vocational education (CBVE) has most certainly arrived. Numerous states have mandated CBVE implementation. Groups such as the Vocational and Technical Education Consortium of States (V-TECS) and the Interstate Distributive Education Curriculum Consortium (IDECC) are identifying competencies and developing objectives and related materials for a variety of occupations. With such a flurry of activity, one might well ask, "Where will CBVE lead us?", or "What does CBVE promise to bring us that is different from our present educational system?" These and similar questions raised by vocational educators reflect the pragmatic feelings which professionals have, feelings ranging from eager acceptance to outright rejection.

The establishment of any contempory curricular movement should alert educators to begin carrying out a thorough examination. Taking a close look at a curricular movement is sure to reveal several of its basic strengths and limitations. This also holds true for CBVE. Like most other movements, CBVE does not claim to solve all of our problems; it is merely designed to be an improvement over our present situation. This paper is based on the conviction that CBVE does have promise to improve education. However, it is also recognized that CBVE has several potential limitations. After the concept of CBVE has been discussed in greater detail, several of these advantages and limitations will be presented and elaborated upon.

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[1]Portions of this paper have been extracted from Finch, Curtis R. and John R. Crunkilton. Curriculum Development in Vocational and Technical Education. Boston: Allyn and Bacon, 1979.

CBVE: SOME BASIC CONSIDERATIONS

There are several aspects of CBVE which distinguish it from conventional instruction. Although each of these aspects may be found in some conventional curricula, it is their collective use that constitutes a truly competency-based program. CBVE has been variously described as focusing on several key areas. These areas include the nature of competencies, criteria used to assess the competencies, ways that student competence is assessed, student progress through the program, and the program's instructional intent (Finch and Crunkilton, 1979).

COMPETENCIES

At the core of CBVE is the competency. It reflects the ability to do something in contrast with more traditional ability to demonstrate knowledge. Specifically, competencies for vocational and technical education are those tasks, skills, attitudes, values, and appreciations that are deemed critical to successful employment. Just because something is performed by a worker does not mean that it is automatically classed as a competency. The worker must, in fact, find this competency to be a critical aspect of employability in the occupation. Each competency, then, evolves from explicit statements of worker roles; and, since competencies align so closely with the occupation, student competence is ultimately assessed in much the same way as that of a worker. In order to insure that assessment will be fair to the student, all competencies are detailed and made available for anyone to examine.

CRITERIA

In the assessment of student competence, it is not enough to merely call for a global exhibition of performance. The teacher must also have available those specific criteria which clarify each competency. Criteria associated with each competency have to reflect both the level of acceptable performance and the conditions associated with this performance. As with competencies, criteria are also made available to each student so there is no question as to what constitutes mastery.

ASSESSMENT OF COMPETENCE

When student competence is being assessed, primary consideration should be given to application. Although it may not be possible for all vocational students to be assessed as they perform in actual worker settings, this is the ultimate evaluation environment one should strive for since it is the most realistic. Even though it may not be possible to assess competency on the job, each student should be evaluated as objectively as possible using the most realistic, applied standards available. Unlike some traditional instructional modes, student competence and not grading serves the primary evidence of achievement. Consequently, instructional staff are required to move beyond the traditional knowledge type measures such as multiple-choice and essay examinations and focus on assessment which aligns with worker competence in the real world.

STUDENT PROGRESS

A curriculum is typically divided into clearly identifiable time frames such as years, quarters, terms, semesters, and weeks. These serve as starting and ending points for various portions of the instruction and

enable an instructor to say that students have completed a certain phase of the curriculum. In fact, students do not always achieve at the same rate. Abilities such as reading, mathematical, and verbal comprehension vary greatly among vocational students and a time-based curriculum cannot take this wide variance into account to the extent that any instructor would like. In contrast with a time-based mode, competency-based education uses demonstrated competence as a determiner of student progress toward program completion. This enables students to proceed through a program at their own particular rates, based upon their individual abilities, and thus master specified competencies in a shorter (or longer) time period.

INSTRUCTIONAL INTENT

The explicit intent of competency-based education is to facilitate student achievement of competencies specified in the program. Each instructor is obligated to provide a sufficient variety of learning experiences so that students will be afforded an opportunity to master a minimum set of competencies; and, in effect, the instructor may be held accountable for student achievement.

Several additional aspects of competency-based vocational education may not be classified as mandatory elements but are quite often found in programs of this type and, in many respects, enhance the operation of a competency-based program. In fact, many operational programs utilize these elements as primary means of aiding students in achieving mastery of program competencies. Those elements most often found in competency-based programs include individualization, instructional technology, systemization, and modularization.

ADVANTAGES OF CBVE

There are several distinct advantages afforded by competency-based vocational education. Although they apply to a greater or lesser degree in different educational settings, each can be considered a basic plus when CBVE is implemented. This is particularly true when instructional modules are being used as a part of CBVE. Advantages take the form of more direct focus on the individual student, greater quality control, and increased relevance within the curriculum (Finch and Crunkilton, 1979).

FOCUS ON THE INDIVIDUAL STUDENT

As CBVE is incorporated into the instructional process, the instructor will begin to note a change in his or her role. Instead of lecturing to groups, the instructor becomes more involved in facilitating, managing, and evaluating learning experiences and serving as a student resource. Time which might otherwise be spent speaking to groups of students can now be used to assist individual students where they need help. One student may move through a series of learning experiences at a fairly rapid pace and need little assistance while another might need help many times and proceed rather slowly. The fact is that, because students are able to work on their own and are more responsible for their actions, the instructor can be available more often to meet with each student, determine how he or she is progressing, and decide what assistance, if any, is needed.

QUALITY CONTROL

Although the need for extensive quality control in education is well recognized, incorporating this concept in a curriculum is quite difficult.

LIMITATIONS OF CBVE

By virtue of its characteristics, CBVE has certain limitations in the instructional environment. However, it may be best to call them potential limitations since, in many cases, problems may be reduced or even eliminated if a concerted effort is made in this direction. What then are some of the major limitations associated with CBVE? These generally include difficulties in module development, scheduling and grading processes, and instructional support (Finch and Crunkilton, 1979).

MODULE DEVELOPMENT

Logically, a module or self-contained learning package is only as good as the person or persons who develop it. And at this juncture, the success or failure of modular instruction is often decided. A finished module may contain meaningful objectives and assessments, but if the various learning experiences are tedious or poorly written, the package will most likely be rejected by students. Furthermore, a module with major shortcomings is worse than no module at all since the effect is students being turned against modular instruction. It is imperative that all modules used in a curriculum are of a high quality in terms of both instruction and subject matter content. Problems in these areas will surely cause students to react in an adverse manner. The limitation that presents itself in this regard is one's ability to write. If the instructor can communicate well in writing and is creative and precise, the development of high quality modules should present no problem. However, if an instructor cannot develop and arrange content so that it flows smoothly and logically and stimulates students to master objectives, the finished product will not be accepted by learners. A second limitation associated

with the development process is time. All too often, the vocational and technical instructor has numerous responsibilities besides writing instructional packages; and writing a module becomes a lower priority when one is "asked" to develop next year's budget or participate in preparations for an accreditation visit. Time, the ingredient needed so much when modules are being developed, is often absent. This absence can certainly affect module quality since many hours must be devoted to development if the finished product is to be acceptable and usable.

SCHEDULING AND GRADING PROCESSES

Some of the processes associated with traditional instruction can severely limit the use of CBVE. Even though an instructor wants to develop a program which is competency-based, scheduling requirements may dictate otherwise. Rigid rules such as no provision for incompletes or non-acceptance of module completion as evidence of progress toward program completion make it difficult for any instructor to implement instruction which really meets students' individual needs. Grading can also present a significant problem. Since CBVE is designed to help students attain mastery of objectives, the basic "grade" would be either a pass or a no-pass instead of a letter grade (e.g., A,B,C,D,F). The instructor who decides to use CBVE should, therefore, be sure that program mastery is compatible with some sort of grading scheme if the school requires that grades be given. Perhaps different levels of mastery can be stated which are, in turn, associated with different grades; or, it may be possible to note achievement in accordance with the number of competencies a student masters. In any event, as long as grading is being used in a school, provision must be made for compatibility with CBVE. Otherwise, there will be severe limitations imposed on the use of CBVE in the vocational and technical program.

All too often the instructor "feels" that students can demonstrate competence in a certain area but lacks the system necessary to be sure that this is true. Because the conventional instructional process may not allow each and every student to demonstrate how well he or she can perform, some students might never be required to show how well they are able to do certain things. If carried to extremes, this situation could lead to the development of graduates who range from extremely effective to completely incompetent. Obviously, CBVE cannot solve all the problems associated with vocational and technical instruction but it may be able to improve the quality control process, particularly as students move toward completion of the curriculum. Although some students may proceed more rapidly than others and complete a number of learning experiences, there should always be a minimum level of competence associated with successful completion of a curriculum. By using explicit standards such as those found in modules, the instructor is given a unique opportunity to specify standards and provide them to students. Thus, each student knows exactly what standards are expected and can work toward their achievement.

RELEVANCE WITHIN THE CURRICULUM

A final advantage of CBVE is improved relevance. But just how is relevance increased within a curriculum, particularly from the student's vantage point? Since CBVE is designed to assist students in the mastery of specified objectives, the effects of this approach on students are fairly simple to judge. The student should easily see that objectives are actually spelled out and that detailed guidance with regard to meeting these objectives is provided. Thus, each student should be able to note the relationship between instruction and instructional outcomes.

INSTRUCTIONAL SUPPORT

CBVE is often enhanced by single concept films, slide-tape presentations, and other types of media; and it is this enhancement which may become a problem to the instructor. Media is often quite expensive and it may necessitate the use of expensive equipment which neither the instructor nor the school is able to afford, even though the item can make a significant contribution to the learning process. Instructional support then can become a major problem when one decides to establish individualized, competency-based instruction. This is in terms of both financial and logistical support. If a resource is needed to assist students in achieving certain objectives, the resource should be acquired and made available to them. Otherwise, some students may not be able to achieve the objectives and suffer from this lack of achievement.

CONCLUSION

It is obvious that CBVE is not without its shortcomings. However, while some of these shortcomings are formidable, they can certainly be dealt with adequately by experienced professionals.

CBVE appears to hold the promise for further excellence in vocational education. It has the power to accomplish this by providing students and teachers with meaningful competencies, criteria, and assessments to enhance program quality. CBVE's focus on mastery and facilitating student achievement builds upon sound principles of learning. The enhancement of CBVE through individualization, instructional technology, systemization, and modularization gives this movement even greater potential to prepare vocational students for the work world.

Some may well say that it is best to take a wait-and-see approach. Unfortunately, if every vocational educator waits, there may be nothing to see. Perhaps it is more appropriate to move forward with CBVE, exploring and experimenting to find out how elements work together and improve teaching and learning. The opportunity exists to become part of an exciting educational movement but it is only through active participation that we can hope to realize the promise of CBVE.

PREPARING VOCATIONAL TEACHERS TO COPE WITH COMPETENCY-BASED INSTRUCTION

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Richmond, Virginia
May 9, 1979

PREPARING VOCATIONAL TEACHERS TO COPE WITH COMPETENCY-BASED INSTRUCTION

INTRODUCTION

Like it or not, we teacher educators are caught up in a revolution! The ideology of competency-based vocational instruction is taking root in schools, colleges, and even whole states in many areas of the country. Advocates of competency-based instruction (CBI) have infiltrated into positions of educational leadership. Thousands of students are under the influence of these new ideas.

Fortunately, this is a benevolent revolution. A revolution of creative ideas, in which no one is hurt, many benefitted. Among the places where CBI has taken hold are the well-known 916 Technical Institute in Minnesota; Suburban Hennepin Technical Center in Minneapolis; Sanford, North Carolina; Boone County, West Virginia; Polk County, Florida; and the Commonwealth of Kentucky. Now Virginia is joining this forward-looking group.

Nationwide, schools, school systems, and community colleges are in various stages of development. Some are in an "early awareness" stage, while others are, of course, hardly yet aware of the movement. Results are in many places uneven, and the principles of CBI only incompletely applied. There are, however, enough striking successes to make us certain that competency-based vocational instruction works, and that it is in many ways a significant improvement over what we have been doing.

We in teacher education have some catching up to do. We have been trying to lead the parade from a position well behind the band. Leadership has generally come from the schools and colleges when it should have come from the universities. In many states teacher educators have been

reluctant to acknowledge the importance of the CBI movement, contending that CBI is just a passing educational phase to be ignored until it goes away, or that CBI is mechanistic and inhumane and therefore unfit for the serious attention of teacher educators. Others have said that CBI is unmanageable and will collapse of its own weight. We have tended to demand of CBI a certainty of performance and level of result that we would never ask of conventional programs and have dismissed the whole concept when certainties could not be guaranteed.

These delaying tactics, though sincerely put forward, are no longer acceptable. We must get on with the job of preparing teachers to cope with CBI...and, more important, to succeed with CBI. The present time is not a moment too soon.

PRINCIPLES OF COMPETENCY-BASED VOCATIONAL INSTRUCTION

The principles of competency-based vocational instruction are widely known and now generally accepted by the profession as being good ideas. But the principles will remain simply noble abstractions until someone puts them into practice. Only then will the ideas come alive and benefit students in vocational training programs. Ultimately, it is the vocational teacher in the classroom and laboratory who has the burden of responsibility for making competency-based instruction function. If the teacher must perform the miracle of turning principle into practice, then it follows that he or she must be prepared for the task.

Let us take a brief look at the concepts of competency-based vocational instruction to see what broad implications for teacher education are embedded in them.

The first principle is that the competencies (or skills) students are to demonstrate are (1) derived from an analysis of tasks performed by incumbent workers, and (2) explained to students in advance of instruction. This implies that vocational teachers must be able to analyze their occupations, specify occupational competencies, and develop performance statements.

The second principle is that the competency-based instructional program is specifically designed to help students achieve the specified competencies and provides for a variety of student learning styles and range of student abilities. To put this principle into practice teachers must be able to use competency-based instructional materials, organize the vocational program to install CBI, manage the learning environment, and guide students through the CBI program.

In a CBI program, assessment of student competency (1) uses student performance as primary evidence of competence, (2) strives for objectivity, and (3) takes place when the student is prepared for assessment. Further, the measures used to assess student achievement are based directly upon the specified competencies and are explicit in stating expected levels of mastery. To accomplish all this, the teacher needs to devise assessment instruments, establish assessment procedures, and must conduct objective assessment of student performance.

The final basic principle of CBI contends that students' rate of progress through the CBI program (1) is determined by demonstrated proficiency rather than by time or course completion, and (2) may vary with individual student's characteristics. This implies a host of teacher skills, including providing individualized instruction, managing the complex CBI program, and maintaining accurate student records.

Each of the broad areas of teacher competence may include many specific and unique skills. Most of these teacher competencies have direct implications for teacher-education programs.

PROBLEMS OF TEACHER EDUCATION FOR CBI

What do we as teacher educators need to do in order to help teachers cope with CBI? What kinds of changes do we need to make in our teacher education programs to ensure that vocational teachers are prepared to move into competency-based training programs?

Firstly, we ourselves must be prepared for competency-based instruction. We must have a thorough grasp of CBI concepts and their implications for teacher training. We need to be knowledgeable of the current scene, aware of the potential and the problems associated with the CBI approach. Certainly, teacher educators will need to be open in outlook and willing to learn. Unfortunately, there is no formal course or educational program for teacher educators who want to learn more about their new role; much of this will have to be self-directed learning.

Secondly, teacher educators will need to help teachers look on the advent of CBI as a great opportunity for advancement, not as a threat. Vocational teachers will take their cue from their mentors, so we have a crucial responsibility to instill positive attitudes and to create enthusiasm for the challenge ahead.

Thirdly, and extremely important, we must revise our university programs and our inservice education activities to include a sound component of training in the competencies needed by teachers to install and manage CBI programs. While there is much yet to learn about CBI, we know enough to design valid teacher training experiences. In 1979 or 1980 no vocational

teacher should be receiving a degree or teaching certificate without having achieved mastery of the relevant teacher competencies.

Fourthly, vocational teacher educators will be asked to work with school systems, community colleges, and the state department of education to help design and install their competency-based occupational curricula. Teacher educators can design CBI instructional models, develop individualized occupational training materials, and conduct vocational teacher inservice education for CBI.

Finally, as the competency-based approach to education develops and matures, teacher educators must be ready to conduct the required research and evaluation that has to be done if CBI is to improve and grow. There is much work ahead to determine its educational effectiveness, its management efficiencies, and its values as compared to other modes of instruction.

TEACHER COMPETENCIES FOR CBI

One of the difficulties in preparing vocational teachers for their new role and responsibilities in using the competency-based approach is that the unique skills needed to install and conduct competency-based instruction have not until now been clearly identified. Such has been the pace of events that even well-known and fairly recent studies of teacher-training needs do not include these competencies. It is essential to have a verified list of competencies in order to plan teacher-training programs, to develop appropriate teacher education instructional materials, and to assess the effectiveness of teachers and programs. In a recent project at the National Center for Vocational Education we took the first steps in identifying such a list of teacher competencies.

The first part of the task involved a thorough search of the professional literature to determine what had been done relative to identifying teacher competencies for CBI. Searches were made of the ERIC system and AIM/ARM. A manual search of sources in the university library, including recent doctoral studies, was also done. The results of these searches revealed that the competencies had not been specifically identified, though many sources agreed that there were unique teaching skills inherent in the CBI approach. From the literature on teacher roles and responsibilities in CBI, it was possible to draw inferences and to develop a series of 22 tentative competency statements.

The second step in the identification process utilized the expertise of a DACUM committee to develop a separate list of competencies. The committee consisted of ten people directly involved in competency-based education. The DACUM (Developing A Curriculum) process utilizes a modified small-group brainstorming technique to generate competencies within a period of one or two days and is under the guidance of a neutral coordinator. The group identifies main categories and specific skills, then organizes these into a chart of competencies. A series of 64 competencies were identified in this process.

Vocational teacher educators reviewed the two series of statements, eliminated redundancies, resolved inconsistencies, and in general refined the wording. The resulting list consists of 45 teacher competencies grouped in 12 categories. The list is available to conference participants and appears in the ERIC system as a part of the final report of the project. Further work needs to be done to update and verify the competencies by submitting them to the review of a national sample of education personnel experienced in competency-based instruction.

TEACHER EDUCATION MATERIALS FOR CBI

If vocational teachers are to be trained to install and manage competency-based programs, it will be important to have specially developed training materials available for this purpose. That a search of the literature reveals there is very little now available is hardly surprising. The CBI approach has been so recently accepted, and materials developers so occupied with other urgent matters, that the problem has not been fully addressed.

As products of The National Center's CBI Project, two prototype individualized teacher education modules were developed. It was determined that the clusters of teacher competencies related to the basic concepts and practices of CBI and the day-to-day management of a competency-based program should be the subjects of the first modules. Following the format and structure proven to be successful in the PBTE Curricula, these two modules are part of an envisioned series of twelve needed to deliver on the entire 45 teacher competencies.

A number of other instructional materials are available from various sources, all of which may be helpful to teacher educators as they plan teacher preparation programs.

> Virginia Polytechnic Institute and State University has produced a module on the principles of CBI. Written for Home Economics teachers, it should also be suitable for others.
>
> Clemson University is publishing a series of nine teacher education modules on the use of V-Tecs catalogs and the application to CBI. These could be adapted for use by other states.
>
> The 916 Technical Institute in White Bear Lake, Minnesota, has developed seven self-instructional modules on CBI and personalized instruction at its own institution.

Florida's Division of Vocational Education has a handbook on CBI designed to aid teachers and teacher educators in using this instructional approach.

Holland College, Prince Edward Island, Canada, has a series of learning packages designed to help the institution's staff to function in that comprehensive CBI program.

The book by Purcel and Knaak, Individualizing Vocational and Technical Instruction, can be used as a basic text for teacher education courses.

Selected PBTE modules in The Center's series are applicable to preparing teachers for CBI.

The Commonwealth of Kentucky uses 11 inservice teacher education modules on CBI. While developed for the Kentucky Model, they may well be valuable in other V-TECS states. Kentucky's "Module Development Handbook," available in ERIC, could be very helpful to module writers.

In addition, there is a great deal of instructional material (modules and learning packages) available for technical training using the CBI approach.

IMPLEMENTING TEACHER EDUCATION FOR CBI

There are a number of possible options for implementing training for competency-based instruction. The choice will depend upon several factors, including (1) the nature of the institution's present vocational teacher education program, (2) the size and expertise of the faculty, and (3) the demand for competency-based instruction in the institution's service area.

In any case, it is extremely helpful for teacher educators to be able to work within a master plan for implementing CBI in the state. The master plan should indicate the major projects on CBI to be initiated, the time schedule of CBI implementation events, and procedures for coordinating the several efforts needed to accomplish the implementation process.

Among the ways in which teacher education institutions can elect to deliver instruction for CBI is to initiate a new college course designed

for the purpose. While this is often the first response of college personnel, it may have disadvantages. Teacher education curricula are usually already overcrowded, there are many administrative hurdles to jump, and the time required for getting the course in operation may be excessive. For many programs, this may be the least desirable solution.

More practically, it is possible to integrate an instructional unit on teaching in a CBI program into an existing methods course. A unit utilizing performance-based procedures would be best, but instruction can follow conventional lecture/discussion methods if need be. Typically, this is by far the easiest mode of delivery of training for CBI and could be undertaken by the next academic semester without undue difficulty.

Ideally, the most logical approach is to include CBI instructional modules in an ongoing performance-based teacher education (PBTE) program. The basic principles and practices of CBI and PBTE are the same, only the target audience and subject matter differ. Ultimately, incorporating CBI preparation in a PBTE program is the way it should be done. If we expect pre- and inservice teachers to use the CBI approach we should be modeling that approach ourselves.

Special workshops on CBI for inservice teachers are an obvious way to meet their needs. Much has already been done, but installation problems remain to be overcome. The workshop itself should be competency-based, permitting teachers to progress at their own rate through the instructional program. One week of concentrated work has been found to be about the minimum requirement.

Lastly, a very effective way to introduce teachers to the principles and practices of CBI is to utilize that approach in a technical course. The entire course can be built on CBI operational procedures, including use

of verified competencies, individualized instruction, self-paced progress, and require mastery of competencies. Students functioning in the course personally experience a CBI program, and teacher education materials can help them to understand what is taking place.

THE UCF PROGRAM

It would be fair to ask what the University of Central Florida is doing to prepare teachers to cope with competency-based vocational instruction. While it is still early days, we believe we are moving in the right direction. We are planning to prepare vocational teachers for CBI in four phases:

1. The entire professional component of the vocational teacher education program is performance-based, employing all the basic principles and practices of PBTE. Teachers are therefore learning by immersion.

2. The beginning sequence of teacher education includes several competencies dealing with CBI concepts. We use the module "Orient the School and Community to Competency-Based Instruction."

3. The advanced vocational teacher education program includes the remaining identified teacher competencies for CBI. We are using modules and other materials as available.

4. Special CBI Workshops are being organized to focus on specific needs of particular teacher groups. A workshop may be presented on module writing, another on identifying occupational competencies.

CONCLUSION

In this paper we have attempted to emphasize the need to prepare vocational teachers for CBI. We have identified the important skills that teachers must achieve to be able to install and manage CBI programs. Some recommendations have been made as to how teacher education institutions can respond to meet the educational challenge confronting them. It has

been suggested that it is up to each of us in the field of teacher education to re-examine our programs and to develop clear plans of action.

I believe that the time for debate about the values of competency-based education is drawing to a close. It is now time for teacher educators to move forward. All of this implies an active, productive, and exciting role for teacher educators as the idea of competency-based vocational instruction moves from the pages of professional literature into the realities of the college classroom and the school vocational classroom and laboratory. In order for CBI to reach its full potential for improving vocational education, it will take the most creative thinking and the best efforts of us all.

IMPLEMENTING CBVE AT THE LOCAL LEVEL

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Richmond, Virginia
May 9, 1979

IMPLEMENTING CBVE AT THE LOCAL LEVEL

THE CONDITION OF EDUCATION AT START-UP OF DISTRICT 916

During the late 1960's and early in the 1970's the State Department of Education, the State Board of Education and various educational groups such as counselors had some real concerns about the Minnesota Area Vocational-Technical Institutes (AVTI's). Although the AVTI's had excellent placement records and a generally good public image, the concerns were:

1. Criticism for being "too selective". Counselors were complaining that it was more difficult to get students into AVTI's than into college.

2. Lack of access for handicapped, disadvantaged, minorities, and students with low academic ability.

3. Lack of opportunity for secondary students. Now that the AVTI's had become almost entirely post high school, what was to be the answer for those students for whom there would not be any post-secondary education?

The District 916 board "echoed" these concerns and expanded on them in their broad goals. They wanted a system that would:

1. Not require post-secondary students to repeat skill and knowledge acquired in high school or elsewhere.

2. Permit Viet Nam veterans (and others) prompt access to programs so they would not have to wait for a new "class" to start.

3. Provide for vocational training for high school age students and facilitate secondary/post-secondary adult mix.

4. Facilitate training of the handicapped and disadvantaged.

5. Optimize building cost efficiency (i.e., keep classes filled on extended days and year around).

6. Utilize the latest workable instructional technology of today and look to the future.

7. Be accountable. Train graduates who could be placed in jobs at reasonable cost.

DISTRICT 916 FUNCTIONAL OPERATING STRUCTURE

District 916 is functionally organized to provide instructional services in three broad areas as follows: 1) State Board of Education, State Department of Education, and State/Federal/Local Laws; 2) District 916 Board; and 3) Component District Boards.

DISTRICT 916 STUDENT BODY

Although students enrolled at 916 vary from month to month, the following is a typical "picture" of attendance at a given time:

1790 Post secondary vocational-technical students in current attendance

1100 Shared-time high school students, 2 hours daily bussed from 14 senior high schools

1500-2500 On-going membership in adult part-time and extension vocational technical training; 5,500 annual enrollments

400 Trainable mentally retarded students pre-school through adult in operational and contracted programs

Also attending:

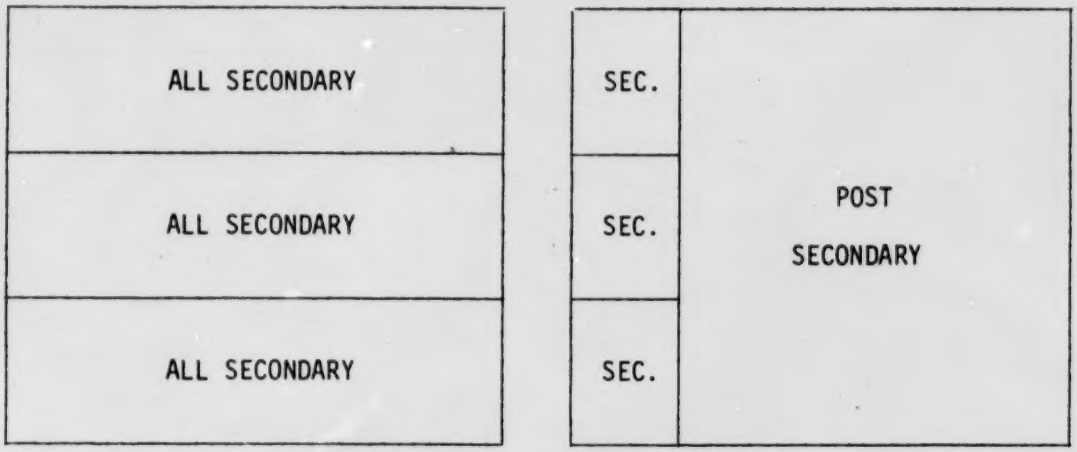
20-100 Iranian and Saudi Arabian vocational instructors (as students)

SECONDARY VOCATIONAL CENTER ARTICULATION

The 916 Secondary Vocational Center is the largest single center in the state (approximately 1100 enrollemnt) and has the largest choice

of offerings (46) available to secondary students. Students from 14 senior high schools in 9 districts attend in three shifts in the following general model:

916 VOCATIONAL CENTER



Pure Secondary

- Three 2-hour periods
- 7 programs
- 590 students
- 51% of center enrollment*

Mixed Secondary/Post Secondary

- Three 2-hour periods/one 6-hour period
- 43 programs
- 565 students
- 49% of center enrollment*

*Registrations for 1978-79 school year

Secondary students who master work while in high school are not required to repeat that work as post secondary students.

DISTRICT 916 PROVEN EDUCATIONAL MANAGEMENT AND INSTRUCTION PROCEDURES

During the past four years, District 916 has received unsolicited recognition for the following educational management and instruction procedures and practices:

1. Competency-based, personalized, computer-managed instruction.
2. Open entry, open access, open exit for students.
3. Year-around day and evening full-time and part-time programs.
4. Complete integration of handicapped and disadvantaged into regular instructional programs with support services. (Typically more than 30% of graduates have needed special support services).
5. Effective training of incarcerated (lowered recedivism).
6. High placement rate of post-secondary graduates (95% last year).
7. Curriculum articulation between secondary, post-secondary and adult vocational programs.
8. Effective use of facilities (3,200 different people utilize 1,400 training stations daily).
9. Time-variable learning system (early completion reduces cost-per graduate. Time variability for learning accelerates faster-learning students and also enables completion by a broader base of school population.)
10. Human relations (916 AVTI mixes a broad cross-section of adult population with students from 14 senior high schools daily. At a time when violence and vandalism in schools is a national scandal, at 916 AVTI it is virtually nil).
11. Community and industry input (56 program advisory committees which meet four times annually and make substantive, continuing changes to keep the curriculum updated).
12. Continuing experimentation with innovative educational practices such as computer-assisted instruction and cognitive-style mapping.
13. Expertise, leadership and experience in developing and using individualized education programs (IEP's) for special education students.

The State Board and 916 Board started 916 AVTI in 1972 as one of the first open-entry, open-exit, competency-based Vo-Tech institutes in the world.

During the last two legislative sessions, and again for 1979, District 916 is requesting state board and state legislative approval for 50,000 additional square feet of construction as provided in the original plan for expansion. This request is intended largely to alleviate crowded internal conditions at 916 and would not materially affect space now being leased.

Further growth is now in the hands of the legislature in that, with existing programs filled and new programs not being funded, growth is an impossibility. In fact, since there is some uncontrollable fluctuation in program membership, 916 AVTI could show a membership decrease in a given year, even though growth potential remains. Adult part-time extension training on- and off-site continues to expand, however.

ESSENTIAL ELEMENTS OF THE 916 LEARNING SYSTEM

What is a learning system? "A system is defined as a set of elements whose relationships are designed to accomplish a desired goal."

What are the elements that lead to the success of a learning system? Even under empirical research conditions it is difficult to select the most effective educational management treatments from the many available. Through some formal and some informal study we have concluded that the following elements (not ranked) do have an impact on the success of the system.

1. The learning system is recognized as a system of instruction and is managed accordingly.

2. The learning system is based on proven educational theory.

3. The learning system is personalized, competency-mastered-based, and self-paced (within reason).

4. Heightened emphasis is placed on the important objectives; i.e., training students to criterion levels, placement and followup.

5. There is strong emphasis on instructional materials and staff development.

6. Student progress and activity is handled through computer-managed instruction.

IMPORTANCE OF SYSTEM

Dr. Douglas Ellson of Indiana University spent a lot of time in researching a list of outstandingly successful instructional programs. The American Institute for Research had pored over 1000 compensatory education programs and selected 21 as exceptional and later added 20 more to the list. Ellson's standards were higher. Only seven of AIR's list of forty were acceptable. He was looking for programs capable of producing improvements by at least a factor of two -- doubled test scores, doubled progress rates, halved costs.

He found seven more in use in military training and a half dozen elsewhere for a total of 20 highly successful programs.

And he was unable to find any distinguishing characteristics among the seven super-star programs, except for one: that they are carefully engineered and rigid in their application.

The staff had clearly spelled out plans for administering the programs, and they required teachers and tutors to follow these plans.

Dr. Ellson admitted that he was a little surprised to discover that successful programs tended to rule out creative teaching, but he thinks he understands why.

"It isn't that creative, imaginative teachers are undesirable, but that they are not reproducible on demand.

"The creative geniuses are going to be successful anyway. The problem has always been, not what to do about the genuises, but how to help ordinary teachers succeed in situations that regularly produce failure.

"The more options a program has for individual imagination and innovation, the more likely it is to fail."

The need for instructional systems was further emphasized by Robert Heinich, noted educational technologist who said,

> Education at the present time is a craft, with emphasis on the use of tools by more or less skilled artisans. The decision whether to use and how to use these various tools is made solely by the artisans--the instructors. And the decisions are generally made on an ad hoc basis at the point of use of the tools in the classroom when the occasion arises. An interesting point to remember is that in any process, if you are in a position to keep decision making ad hoc, you effectively prevent the development of a technology.

In brief, if a learning process is to be improvable, it must be developed into a system. In a system it is possible to hold the proven elements reasonably constant while adding or changing other elements to improve the learning. Jerry Sanders, President of Advanced Micro Devices, Inc., summarized the issue when he said, "There is no shortage of good ideas. Just of the discipline to develop only those that hold the most promise."

In the 916 system of instruction we believe we have the discipline of our competency-based personalized approach, with opportunity for creative teachers to try out new learning resources and treatments without jeopardizing the quality of the instructional program.

The 916 AVTI curriculum essentially consists of:

52 Training programs.

5,800 Job tasks defined.

5,800 Terminal performance objectives written.

23,000 Learning objectives written.

5,800 Learning guides developed including personalized print and audio-visual learning materials; doing and knowing criterion tests.

Many variations of learning materials and resources to meet individual learning needs.

The 916 Time-Variable Mastery Approach to Learning is an extension of experiments carried out in the Carroll and Benjamin Bloom experiments in the 1960's and early 1970's.

Dr. Bloom, author of more than 50 books on education and well known for his work in learning domains, says that he has found three international constructs of learning in the world. These are:

1. There are good learners and there are poor learners.
2. There are faster learners and there are slower learners.
3. Most students become very similar with regard to learning ability, rate of learning, and motivation for further learning -- when provided with favorable learning conditions.

According to Bloom, the first concept is held by about 85% of the people of the world.

Learning ability is considered to be a relatively permanent trait of the individual. It is also the prevailing view that individuals possess different amounts of this trait and that a quantitative index of it can be made by the use of an appropriate intelligence, aptitude, or achievement test. Aptitude correlated with achievement, and the individual student's position in the bell-shaped curve was not apt to change between the 3rd grade and 11th grade.

Under Construct #1, the important task of the school is to weed out poor learners. Marking and streaming systems are built on this. Most students, teachers and parents accept this.

During the early 1960's, interest developed in the Carroll Model of School Learning which was built on the faster learner-slower learner construct.

While it was not entirely clear whether or not rate of learning was a permanent trait of individuals, research was dedicated to finding ways by which the slower learners could be given extra time and help they needed to attain some criterion of achievement. In this research, in both educational laboratories as well as classrooms in different nations, it has become evident that a large proportion of slower learners may learn as well as faster learners. When the slower learners do succeed in attaining the same criterion of achievement as the faster learners, they appear to be able to learn equally complex and abstract ideas, they can apply these ideas to new problems, and they can retain the ideas equally well - in spite of the fact that they learned with more time and help than was given to others. Furthermore, their interests and attitudes toward the school subjects in which they attain the achievement criterion are as positive as those of the faster learners. About 14% of the people of the world now accept this concept. The time concept was sustained in a recent study in California that found time for learning to be more significant in results achievement as compared to a host of educational innovations.

During the past decade, Bloom and his students have done research which has led us to the view that given favorable learning conditions 95-99% of the people of the world can learn almost anything.

This research questions the first two constructs, especially about the permanence of such traits as good-poor learning ability or fast-slow learning characteristics. However, the research does demonstrate that when students are provided with unfavorable learning conditions, they

become even more dissimilar with regard to learning ability, rate of learning, and motivation for further learning.

Evidence to support this third construct has far-reaching implications for teacher training, instruction in the classrooms, the organization of systems of education at the local and national level, selection systems, grading procedures, and the development of new curricula and instructional systems.

But, even more important are the effects of adequate or inadequate learning on the student's view of himself, his interest in learning, and his use of his learning ability as a means of adapting to change throughout his life.

In the mastery experiments, mastery and traditional control groups of students were compared as they progressed through blocks of instructions. The first presentation in both groups was always traditional group instruction, and 20% in both groups were consistently able to obtain mastery with that instruction (A & B students). The traditional control group then proceeded on to the next block of instruction. However, those in the mastery learning group who had not earned mastery, received additional educational treatments within the same calendar time. The same teachers taught both groups. A number of interesting results occurred:

1. Some students in the mastery group initially took 5 times as long to achieve mastery. This declined to 3 times at mid-point, and 1 ½ times by completion.

2. In the mastery group 80% achieved mastery while 20% of the traditional students achieved that level.

3. Initially 60% of the students in each group were applying themselves to learning. At the end, 85-90% of the mastery students were applying themselves to learning while the traditional group had dropped to 40%.

There are also some broad societal implications to mastery learning:

1. Mastery learners have learned to cooperate rather than compete.

2. Mastery learners have a sense of adequacy. There are powerful relationships between achievement in school and self-concept.

3. There is a powerful relationship between achievement in school and mental health.

4. Group instruction is an errorful method of instruction -- especially in highly sequential subjects. Brootley and Good found that small numbers of students get the major resources.

   a. Teachers instruct with only certain students in mind -- those who are attentive and nod at the right moment.

   b. Who is being reinforced? Those students who are attentive and nod at the right moment.

   c. Who is participating? The same group.

   d. Doloff found that in Sweden student teachers get practice in cueing to right students. In the U.S.A. the upper ¼ to 1/5 get most of the attention.

   e. Group instruction gives to some and denies to others.

5. In mastery learning 80% become similar to "most favored students."

   a. Errors at each stage are removed to avoid compounding later errors.

   b. Peers, parents, and siblings can help.

6. If 80% can learn anything, what is worth learning well?

7. Who decides who shall learn what?

The third element of the 916 system, competency-based, personalized and self-paced instruction, was not started because anyone especially wanted to be innovative. Rather, it seemed to be the only approach to meeting the system's educational management requirements. The <u>educational management</u> reasons for a personalized, competency-based system can be summarized as follows:

1. Students are not required to repeat learning of skills and knowledge previously learned.

2. Students can obtain immediate access to instructional programs.

3. Handicapped students can obtain immediate access to instructional programs.

4. Handicapped students can complete the segments of an instructional program which they are able to do.

5. The instructional staff can be used more efficiently.

6. The building and instructional equipment can be used more efficiently.

7. The placement of graduates in jobs is assisted.

8. Students with a wide range of entry-level skills can be accepted.

9. The content for instruction is available 24 hours per day for part-day students.

There are also important educational advantages to the personalized competency-based system. Some of these are:

1. The learner progresses at his/her own best rate to mastery of the instructional content.

2. More learners achieve mastery than under what is possible with group-centered instruction.

3. The learner builds confidence by succeeding in learning.

4. The students learn to help each other learn rather than to compete for grades.

5. Learners may speed up their personal learning.

6. The presentation of the content of instruction is assured to be consistent.

7. Students can learn according to their preferred learning style.

8. The efficiency of the instructor is increased.

9. The instructor performs as a manager of learning--rather than as information giver.

The educational management advantages are inherent with the system and are relatively easily realized. The educational advantages represent the quality assurance factors and are not automatic. Quality must be

built-in with a great deal of attention to learning materials, staff development, and learning systems maintenance.

As a fourth element of the system, District 916 has had a strong focus on objectives critical to the system since its inception. The system is managed by objectives which are constructed and agreed upon in a revolving type of information system. A part of instructor compensation is also built on incentives based on some of the more measurable objectives. These include:

POST SECONDARY	SECONDARY	SPECIAL EDUCATION
Program ADM	Program ADM	Individual Student Education Plan (Develop and Implement)
Graduates	Attendance Improvement	
Curriculum Development	Attendance Maintenance	
Placement	Student Progress Process	
Dropouts	Curriculum Development	

Fifth, 916 has had a strong emphasis on staff and materials development. An in-service task force comprised of instructors and administrators plans jointly for five in-service days per year. In addition, instructors make visitations and attend many other industry meetings to improve their skills. New instructors complete a total of seven modules of training on the 916 learning system under the direction of a part-time teacher-trainer. These modules include:

Unit 1 Working at 916

Unit 2 Becoming an Instructor

Unit 3 Using the Personalized System of Instruction

Unit 4 Designing Self-Paced Curriculum for the Personalized System

Unit 5 Selecting and Designing Resources

Unit 6 Developing Evaluation Instruments

Unit 7 Revising the Curriculum

District 916 has always focused strongly on learning materials development.

The 916 Vocational-Technical Instructional Program is designed to function at a high degree of self-instruction on a self-paced basis.

The personalized instruction curriculum is built around job tasks which are derived from the occupation in which training is being given.

A Terminal Performance Objective (TPO) is written for each task, and a Learning Guide is written which meets the instructional requirements of the TPO. A Learning Guide, in company with all the supporting learning materials and resources, becomes a Learning Package.

The 916 personalized learning system, with fifty-two personalized programs has more than 5,800 tasks and TPO's, 23,000 learning objectives, and many varieties of audio-visual and print-learning resources.

916 AVTI has and is producing personalized learning materials for use at 916 AVTI, state-wide, nationally and internationally with its own staff and under contracts with the 3M Company, Control Data Corporation, Omnia Corporation, the Veteran's Administration, and U.S. Health Department--State Department of Education, the Saudi Arabian government, and school districts in several states.

Through the packaged approach to instruction, many of the modules of the day program are available to adult extension students and they can progress toward certification in a regular program by attending extension classes.

The last important element in the system of learning is the ability to track student progress carefully. When students are individually paced, it is essential that student and instructor keep track of individual mastery progress. If a student is not making progress it is necessary to find that out quickly, and to identify and remediate the problem. Some of the essential reports include:

A. Monthly (Individual) Student Progress Report. This lists tasks mastered and provides a visual record of individual progress against standard time.

B. Student Progress Summary Report. This report summarizes student progress by student and by program. Students falling below 67% of standard rate will receive intensive counseling.

C. Student Termination Reports. These are monitored on a monthly basis to keep tab of current drop-out rates.

D. Students Seeking Placement. This report identifies students who are eligible for placement and provides a reminder if the student exit dates become too far removed from the placement date.

E. FTE Report. This report identifies and weighs the number of handicapped and disadvantaged students in the class.

F. Student Transcript. This transcript lists tasks mastered, providing prospective employers with hard data about actual content of the course and competence of the graduate.

Nearly 100 different reports can be produced from the 916 Student Management System (SMS).

STUDY OF TIME VARIABLE SYSTEM

District 916 sought institutional research assistance over a period of three years. Although the District has been involved in a considerable amount of developmental curriculum research, it has not been possible to obtain external funding for institutional research on the system. Therefore, in 1977-78 the District initiated its own institutional research

function. The primary purpose was to study the impact of the time variable system on its clientele and on its costs.

The findings can be summarized as follows:

1. With all post secondary graduates considered over a five-year period, more persons graduated before standard time than after. The net savings over a five-year period was 602 student months of a total of 22,387 months attended or 3%.

2. In only one of the five years was there a net loss on standard time. The experience record over a five-year period was as follows:

1972-73	133 Student months saved
1973-74	170 Student months saved
1974-75	13 Student months saved
1975-76	18 Student months saved
1976-77	304 Student months saved
Net	602 Student months saved

3. The completion time for veterans was less than average -- 143 student months saved.

4. The completion time for graduates who were previously enrolled in 916 high school programs was less than average -- 602 student months saved.

5. The completion time for handicapped and disadvantaged was more than average -- 56 student months lost.

6. The completion time for agency-supported students (other than veterans), i.e., Welfare, WIN, BIA, etc. was more than average -- 56 student months lost.

7. The time variable system is able to function with open enrollment and 30% or more handicapped and disadvantaged without exceeding the average standard completion time.

8. There has not been a significant relationship between completion rates and mean math scores taken from entry tests. This was consistently true for all five years.

9. There has not been a significant relationship between completion rates and mean reading scores taken from entry tests. This was consistently true for all five years reported.

10. The post-secondary dropout rate was higher than state average for the first two years. It is now at or below the average.

11. The per ADM budget for the 916 AVTI is at the state average for all AVTI's for fiscal '79.

SYSTEMS PROBLEMS

A. Dropouts. Initially 916 had a high dropout rate. In a time variable system this has to be monitored closely so that adjustments can be made when it occurs. A number of factors can contribute such as:

1. Even in an open enrollment system pre-admissions counseling is essential. Otherwise too many students get into programs for which they are ill-suited or have only superficial interest.

2. In certain instances if instructors are not motivated to keep students, they may actually encourage students to leave in the hope of obtaining a "better" replacement. This creates a "windmill" effect for the program, with ADM's remaining up but with different students cycling through.

3. Students available for enrollment at non-traditional entry dates often have less overall commitment to learning than more "traditional" students.

4. Breaking the curriculum into competency-based modules enables students to "master" areas of content rendering him/her employable before program completion.

As indicated previously, the dropout rate is now well within the state normal range.

B. Overlapped Students.

1. Agencies who support students in training are pleased when their student clients finish before standard time. However, agency personnel often become very "nervous" about clients who go beyond standard time. Negotiating time for completion of slower learning students is a time-consuming process.

2. State law provides that special needs students may exceed standard program lengths for state aid purposes. However, Department of Education regulations do not extend that advantage to otherwise normal, but slower learning students. Hence, we must either exclude overlapped students from ADM aids, or "drop" them from their program and re-enroll them in a special needs program. We believe that the demonstrated overall efficiency of the system should be recognized so that the "balance" achieved from the early completers can be credited against those who need more time. Otherwise state regulations are actually working against a system whose concept the state endorses.

C. Successful Programs Not Recognized. Other than the invited article in the November 1977 issue of the AVA Journal, District 916 has not sought outside recognition for its programs. However, anonymity has some hazards which became clear during the 1978 legislative session. While the legislature was considering mandating competency-based education for all schools in Minnesota it was also considering S.F. 956 which would have eliminated the District (916) which is one of the best demonstrations of CBE in the country.

NEXT STEPS

Long range plans are, of course, highly dependent on legislature and state board action. In general, this is the direction 916 is headed:

1. Continue to improve and enhance the learning system through staff and materials development, with special emphasis on creating more learning style variability in the learning materials for special needs and slower learning students.

2. Refine the very promising technique of cognitive style mapping to enhance the student learning process.

3. Continue to develop computer-managed and computer-assisted instruction from the media and software which seems to hold the most promise.

4. Construct and/or lease additional facilities to relieve the present space crunch.

5. Expand and enhance non-traditional sources of funding for development, equipment and operations.

6. Cooperate with public and private agencies in the exploration, development and sharing of learning technology.

CBVE IN VIRGINIA

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CBVE IN VIRGINIA

The Virginia Department of Education has shown a great deal of leadership for the development and implementation of competency-based vocational education. The Division of Vocational Education has established the following objective:

> By June 30, 1982, each school division shall have implemented competency-based instruction in approved vocational education programs based on V-TECS and/or IDECC catalogues, if available, or other competency-based materials as reported in the annual Local Evaluation of Vocational Education Programs, and each community college shall have implemented competency-based instruction in at least one program on V-TECS materials as reported by the Virginia Community College System.

The basic implementation strategy has been one of preparing supervisors, administrators and teacher educators first. The supervisors, administrators and teacher educators in turn help prepare the vocational teachers for competency-based education implementation.

TEACHER EDUCATION INSTITUTIONS

A graduate level course on competency-based education has been offered to vocational teachers in numerous settings. The basic framework for the class is the following:

1. The course will be a minimum of 30 to 45 contact hours,
2. The course will be offered on both a college credit and non-credit basis,
3. Teacher competencies will serve as a basis for course content,
4. Criteria will be developed by teacher education institutions in support of identified competencies, and
5. The course will focus on orientation to, development of, and implementation of CBVE.

The following terminal objectives are to be implemented with the course. Students will be able to:

1. Demonstrate an understanding of CBVE - V-TECS.
2. Write and sequence objectives.
3. Utilize criterion-referenced objectives.
4. Select instructional resources for CBVE.
5. Develop instructional materials for CBVE.
6. Demonstrate a knowledge of implementing CBVE in teaching area.

LOCAL SCHOOL DIVISIONS

During 1977-78 the Division of Vocational Education funded 28 projects for county and city school divisions as well as vocational schools. These projects emphasized inservice activities to assist practicing vocational teachers with the implementation and establishment of competency-based vocational education programs. In addition to the inservice activities funded by the Division of Vocational Education, many local school divisions have sponsored their own workshops and conferences on CBVE.

SERVICE AREAS

All of Virginia's vocational service areas have had inservice activities for assisting with the implementation of CBVE. The inservice activities fit a broad range of activities. Teachers' conferences with CBVE as the theme have been held. Workshops emphasizing CBVE have been held. Curriculum guides with a competency base are now available. National studies based on needed competencies have been disseminated. Certain youth organization contests and competition have been placed on a competency-based or criterion-referenced system.

V-TECS

Virginia became one of seven charter members of the Vocational-Technical Education Consortium of States (V-TECS) in July, 1973. V-TECS now has 53 catalogs completed, four completed by Virginia. In addition, there are 49 catalogs presently under development. Published V-TECS catalogs are available through the appropriate state supervisor for each service area. Of these 49, Virginia will complete 5.

STANDARDS FOR CBE PROGRAMS

The Virginia Division of Vocational Education has adopted the following standards for the implementation of competency-based vocational education.

1. Role-relevant competencies that include standards are identified and stated.

   The competencies with standards will be identified through V-TECS, IDECC, and other appropriate research. Advisory committees should be used to review competencies and standards. Competencies in the affective domain will be included. Role-relevant competencies for occupational preparation programs are those that specifically relate to the occupation for which the student is being prepared as well as to the personal needs of the student. Role-relevant competencies are related also to orientation, exploration and/or industrial arts experiences which have been identified for students.

2. Competencies are specified to students prior to instruction.

   A system exists to inform students regarding what will be expected at program completion. For example, teachers may provide profiles, checksheets, training plans, contracts, or other structured methods to identify outcomes. Students are aware of expected outcomes.

3. Criterion-referenced measures are used to measure achievement of competencies.

   Criterion-referenced measures are based on standards that are measurable. Student performance is measured against predetermined standards rather than against other student's accomplishments.

4. A system exists for documenting the competencies achieved by each student.

   The documentation provides a record of competencies achieved. The documentation may be used for articulation of the program to provide a smooth transition of the student from one school to another or from one level of instruction to another level. The documentation is also a means for providing information to employers.

FUTURE OF CBVE

Much has been accomplished toward the implementation of competency-based vocational education in Virginia. A great deal still remains to be accomplished.

Continued efforts at the inservice level must be made. However, additional work at the preservice level has to be both initiated and implemented. The concept of competency-based education for teacher preparation (CBTE) should be examined and utilized to the extent feasible and possible.

The future of competency-based vocational education is bright. Once it becomes fully implemented, then we will all realize just how effective the competency-based concept really is.

APPENDIX A

SUGGESTED FRAMEWORK FOR A
CBVE INSERVICE COURSE[1]

Any first-level CBVE inservice course for vocational teachers should be built upon a solid framework. Basic to this framework are the following:

1. The course will be a minimum of 30 to 45 contact hours.
2. The course will be offered on both a college credit and non-credit basis.
3. Teacher competencies will serve as a basis for course content.
4. Criteria will be developed by teacher education institutions in support of identified competencies.
5. The course will focus on orientation to, development of, and implementation of CBVE.

COURSE OBJECTIVES

The following constitute terminal objectives (TOs) and enabling objectives (EOs) for the course:

TO #1 Demonstrate an Understanding of CBVE - V-TECS

EO #1 Differentiate between CBVE and conventional vocational education.

EO #2 Define terms related to CBVE and conventional vocational education.

EO #3 Describe the V-TECS catalog development process.

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[1]Status Report on Implementing Competency-Based Instruction, Vocational and Adult Education Department of Education, Commonwealth of Virginia, Richmond, Virginia, April 1979. Approved for use by teacher educators who are responsible in the delivery of Competency-Based Education in Vocational Education in Virginia.

EO #4 State the rationale for CBVE.

EO #5 Identify advantages and limitations of CBVE and conventional vocational education instruction.

TO #2 Write and Sequence Objectives

EO #6 Differentiate between terminal and enabling objectives.

EO #7 Select objectives for a teaching area.

EO #8 Sequence instructional objectives dealing with similar curriculum content into a logical teaching outline.

EO #9 Write measurable objectives in three domains.

TO #3 Utilize Criterion-Referenced Measures

EO #10 Administer tests to assess entry level and exit skills.

EO #11 Match criterion-referenced measures to appropriate objectives.

EO #12 Differentiate between criterion-referenced and norm-referenced measures.

TO #4 Select Instructional Resources for CBVE

EO #13 Identify resource materials appropriate for competency-based learning situations.

EO #14 Apply selection criteria for materials unique to CBVE.

EO #15 Identify needed competencies and objectives which are not available through published sources.

EO #16 Evaluate published materials which support CBVE.

TO #5 Develop Instructional Materials for CBVE

EO #17 Construct CBVE modules using materials available in the classroom.

EO #18 Prepare instructional media which will complement the teaching/learning situation.

TO #6 Demonstrate a Knowledge of Implementing CBVE in Teaching Area

EO #19 Analyze local support and readiness for CBVE (e.g., administrative support, student needs, facilities, money).

EO #20 Enumerate difficulties encountered in implementing CBVE.

EO #21 Devise a personal plan of action for implementing CBVE.

TABLE I

TERMINAL OBJECTIVE	RELATIVE TIME	ASSESSMENT PROCESS		
		TEST	PROJECT	REPORT
1	5	X		
2	1 (greatest)	X	X	
3	3	X	X	
4	4	X		X
5	2	X	X	
6	6 (least)	X		X

TIME ALLOCATIONS AND ASSESSMENT

Recommended time allocations and assessment of terminal objectives are presented in Table 1. It should be noted that time figures in Column 1 represent group rankings of relative instructional time allocations. Thus, the lowest figure represents the competency that the group believed should receive the greatest amount of instructional time. The group believed that terminal objective #2 should be allocated the greatest amount of instructional time. This was followed in order by terminal objectives 5, 3, 4, and 6.

The way that terminal objectives might be assessed is also presented in Table 1. Those areas checked represented the way the workshop participants felt terminal objectives should be assessed.

APPENDIX B

CBVE RESOURCE MATERIALS

Burger, L. J., and J. J. Lambrecht. "Handbook for Vocational Instructors Interested in Competency-Based Education." Minneapolis, Minnesota: University of Minnesota, 1974. (Mimeographed.)

Burns, R. W., and J. Klingstedt. Competency-Based Education an Introduction. Englewood Cliffs, New Jersey: Educational Technology Publications, 1973.

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The Center for Vocational Education. Orient the School and Community to Competency-Based Instruction. U. S., Educational Resources Information Center, ERIC Document ED 152 961, August, 1977.

Champagne, D. W., and R. Goldman. Handbook for Managing Individualized Learning in the Classroom. Englewood Cliffs, New Jersey: Educational Technology Publications, 1978.

Diamond, Robert M., and others. Instructional Development for Individualized Learning in Higher Education. Englewood Cliffs, New Jersey: Educational Technology Publications, 1975.

Drumheller, Sidney J. Handbook of Curriculum Design for Individualized Instruction, A Systems Approach. Englewood Cliffs, New Jersey: Educational Technology Publications, 1972.

The Educational Technology Reviews Series. Number Five, Individualizing Instruction. Englewood Cliffs, New Jersey: Educational Technology Publications, 1973.

Fardig, Glen E. A Program of Training for Installing Competency-Based Vocational Instruction. U. S., Educational Resources Information Center, ERIC Document ED 152 959, November, 1977.

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Finch, C. R., and R. Harris, eds. "Implementing Competency-Based Teacher Education: Future Directions for Vocational Teacher Educators." Blacksburg, Virginia: Virginia Polytechnic Institute and State University, 1976. (Mimeographed.)

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Individualizing Instruction for Competency-Based Education, [Department of State]. [State of Florida]: n.n., 1975.

Industrial Arts Education Service. C. B. I. and You, [by Department of Education]. [Richmond, Virginia]: n.n., n.d.

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Johnson, R. B., and S. Johnson. Toward Individualized Learning, A Developer's Guide to Self-Instruction. Reading, Massachusetts: Addison-Wesley Publishing Company, 1975.

Kapfer, P. G., and G. Ovard. Preparing and Using Individualized Learning Packages for Ungraded, Continuous Progress Education. Englewood Cliffs, New Jersey: Educational Technology Publications, 1971.

Kapfer, P. G., and M. Kapfer, eds. Learning Packages in American Education. Englewood Cliffs, New Jersey: Educational Technology Publications, 1972.

Kaufman, R., and F. W. English. Needs Assessment Concept and Application. Englewood Cliffs, New Jersey: Educational Technology Publications, 1979.

Langdon, Danny G. Interactive Instructional Designs for Individualized Learning. Englewood Cliffs, New Jersey: Educational Technology Publications, 1973.

"A Learning Guide." White Bear Lake, Minnesota: Vo-Tech Institute, 1977.

McAshan, H. H. Competency-Based Education and Behavioral Objectives. Englewood Cliffs, New Jersey: Educational Technology Publications, 1979.

Musgrave, George R. Individualized Instruction: Teaching Strategies Focusing on the Learner. Boston: Allyn and Bacon, Inc., 1975.

Sherman, J. G., and R. S. Ruskin. The Instructional Design Library. Vol. 10, Individually Responsive Instruction. Englewood Cliffs, New Jersey: Educational Technology Publications, 1978.

Sherman, J. G., and R. S. Ruskin. The Instructional Design Library. Vol. 13, The Personalized System of Instruction. Englewood Cliffs, New Jersey: Educational Technology Publications, 1978.

Vocational-Technical Education Consortium of States. CBVE Participant's Guide for Inservice Training. Blacksburg, Virginia: Division of Vocational-Technical Education, Virginia Polytechnic Institute and State University, 1977.

APPENDIX C

SUGGESTED OUTLINE FOR A CBVE IMPLEMENTATION GUIDE

I. An Introduction to CBVE

II. Identifying and Verifying Competencies

III. Determining Instructional Constraints

IV. Identifying Student Interests and Needs

V. Developing Objectives

VI. Utilizing Criterion Referenced Measurement Techniques

VII. Selecting CBVE Teaching/Learning Materials

VIII. Developing Individualized Learning Packages

IX. Managing CBVE Activities

- A. Grading
- B. Record Keeping
- C. Training Plans
- D. Individualizing Instruction

X. Articulating CBVE

XI. Evaluating CBVE Effectiveness

APPENDIX D

SUGGESTED MODULE FORMAT*

Introduction. In this section, the student is told how the module may serve as a means of developing certain skills, knowledges, and attitudes. Specific prerequisites (if any) are detailed and directions for proceeding with the module are provided. Also included are a cover page and table of contents.

Objectives. Provided here are specific statements of performance the student should be able to demonstrate while progressing through the module and when completing it. Terminal and enabling objectives specify the activities to be performed, the conditions under which they are to be performed, and the levels of acceptable performance.

Preassessment. This section is useful in determining student entry performance and provides a means of "testing out" of the module if he or she can demonstrate mastery. Student instructions and an assessment form with explicit criteria are placed here to ensure that there is no question about what constitutes module mastery.

Learning Experiences. Learning experiences are detailed that correspond with each of the enabling objectives. They are designed to provide each student with the best means of mastering module objectives. Each learning experience consists of one or more activities followed by assessment and feedback to the student. Learning experiences may include resource materials such as information sheets, references, audiotapes, etc., that serve to enhance the learning process and help individualize instruction.

Resource Materials. This section serves to reference all resource materials used in the various learning experiences so that both teacher and student may locate them rapidly. The resource materials listing aids the teacher in "setting up" for students and ensuring that all materials are available when they are needed.

Postassessment. This section is quite similar to the preassessment and, in many cases, may be exactly the same. The postassessment focuses on the terminal objective and an assessment form is used to determine whether or not it has been met.

*Curtis R. Finch and John R. Crunkilton, "Typical Module Format," Curriculum Development in Vocational and Technical Education, Planning, Content, and Implementation (Boston: Allyn and Bacon, Inc., 1979), p. 231.